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THE DISTRIBUTION OF  
*PARATRYTONE MELANE* AND ITS  
SPREAD INTO SAN DIEGO COUNTY  
(*HESPERIIDAE*)

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THIS PAPER IS INTENDED TO SUPPLY LOCALITY DATA on the distribution of *Paratrytone melane* (Edwards) with emphasis on the nominate subspecies in California. No taxonomic studies of the populations involved have been made. The focal point of this study concerns the spread of *P. melane* into San Diego County in 1941, which was sudden and well noted by resident collectors due to its previous absence from the county.

The California distribution is somewhat allopatric with a northern population concentrated in the San Francisco Bay area and a southern population in most of coastal southern California. The spread of *melane* into San Diego County requires further behavioral and ecological studies to be fully elucidated. It is hoped that this paper will stimulate further study of this species.

LIFE HISTORY

William H. Edwards described the species from two specimens he received from "California" and collected by Tryon Reakirt (Edwards, 1869), perhaps in the Los Angeles area where Reakirt did much of his collecting (Essig, 1931). After Edwards' description little was known of the immature stages or the behavior of *melane* until 1930 when Comstock and Dammers worked out its life history. They reared *melane* larvae on Bermuda grass but observed females indiscriminately ovipositing on a variety of cultured lawn grasses (Comstock and Dammers, 1930). What *melane* oviposits on in "natural" habitats is not known but presumably this would include wild grasses, since this is a larval food source typical of the *Hesperiidae*.

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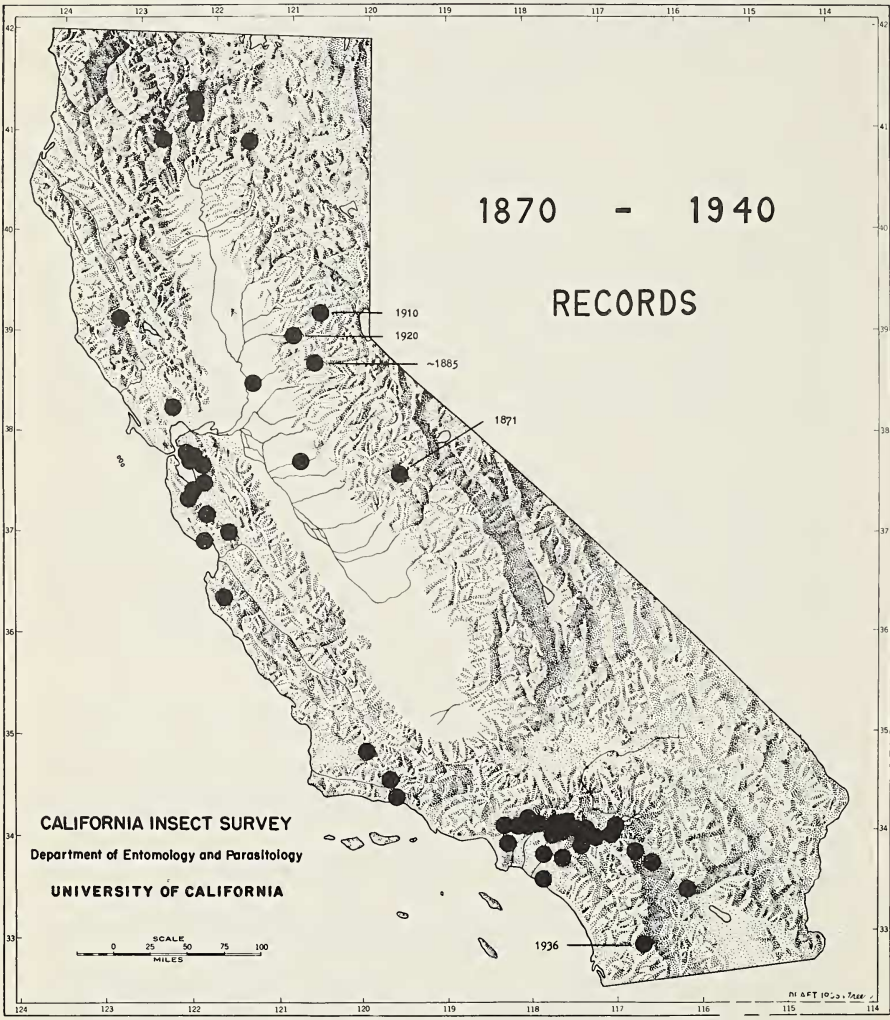


Fig. 1.—1870 to 1940 locality distribution of *P. melane*.

*P. melane* is at least bivoltine in the northern populations, where it is found from March to June and August to October or even longer in certain localities, and is multivoltine in the southern populations, flying from January to November in San Diego.

Previous to 1930 only cursory mention had been made in the literature to the effect that *melane* was to be found in the coastal foothills of California (Comstock, 1927). Since then the skipper has been caught at elevations varying between almost sea level and in excess of 5,000 feet in the Sierra Nevada Mountains. Typically, *melane* is a resident of the moist, grassy land adjacent to perennial creeks and streams of California foothills encompassing the Upper Sonoran life zone and rarely the Transition life zone. When found in any numbers it is usually in the local *melane* colonies present in the same area year after year.

The behavior of *melane* has been observed by the author to include flight along the edges of streams with occasional pauses to feed on the flowers that are available. This streamside flight is moderate and tends to involve circuitous routes whereby individuals retrace their flight patterns the length of the wooded creek area or in a more restricted flight arena. Although excursions to the peripheral areas of a streamside habitat have been observed, mating behavior or extensive dispersion flights have not been observed.

## HISTORY

With many suitable habitats available in San Diego County, it was thought unusual for *melane* to be absent there, yet present only one hundred miles to the north in the Los Angeles area and with no easily defined physical barriers intervening. A list of San Diego County butterflies (Wright, 1930) mentioned *melane* as a possible county resident because of these suitable habitats but there were no records for the county until 1936. The 1936 record ("Mountain area, San Diego County") was not known at the time by resident collectors and is here published for the first time. Prior to 1936 the nearest record to the San Diego area was for Palm Springs (22 Apr 22 - CM) and Indian Wells, Coachella Valley (28 Oct 22 - LACM). The Indian Wells specimen may represent a non-resident individual because of the aridity of the central Coachella Valley (in 1922 there was little irrigation), but the Palm Springs record seems to indicate an established colony, since specimens were collected there



Fig. 2.—1940 to 1950 locality distribution of *P. melane*.



after 1922 and the area does have well-watered canyons as suitable habitats.

August 1941, however, marks the time when resident collectors first encountered *melane* in San Diego County to any extent, regarding it then as a rare capture. F. T. Thorne was one of the first collectors to encounter *melane* and he vividly recounts his excitement upon realizing what was being caught (Thorne, 1963). It might be noted here that lack of adequate collecting in San Diego County should not be considered as substantially contributory to the sudden appearance of the skipper in the county in 1941 because resident collectors were in the field enough to have discovered the species earlier had it been present in any numbers, notwithstanding the 1936 record. Thorne also captured one specimen at the lower end of Mason Valley (= "La Puerta" of old records) in the desert region of San Diego County in October 1941. This site comprises a small area of lush vegetation, high humidity, and year-round running water in a section of Vallecitos Wash.

Since 1941 *melane* has become a well established resident of San Diego County and today it is a common backyard skipper in many parts of the county.

The few individuals who have collected in northern Baja California did not record the species there until 1954 and again in 1958 (Powell, 1958). A very few specimens have been taken in the southern part of the Baja Peninsula (Rindge, 1948) but the remoteness of this population would indicate greater affinities to the Mexican mainland population, as has been mentioned by MacNeill (1962) and Powell (1958). Thus, additional questions arise—Was the northern Baja population present there prior to 1941 or does it represent a southern extension of the San Diego population after 1941? or did the San Diego extension come north from the northern Baja population rather than south from Los Angeles?

### DISTRIBUTION

The map series indicates the presence of *P. melane* during the past century in California. From available records the distribution is seen to be discontinuous with the most intriguing gap occurring in the the central coastal area between Big Sur and Santa Barbara. It should be noted, however, that this gap may be due to insufficient collecting, since this area of California is not yet surveyed as well as other areas.



Fig. 3.—1950 to 1960 locality distribution of *P. melane*.

The northern limit in coastal counties is southern Mendocino County, while records further east take these limits to Maxwell, in the Sacramento Valley. The records for Mt. Shasta, Dunsmuir, Trinity Center, and Burney Mountain are interesting owing to their extreme temporal and spatial isolation from the remainder of the known range. Dr. H. K. Clench has remarked (personal communication) that the Oslar specimens, which only the Mt. Shasta specimen is one of, are of dubious value due to evidence that the accuracy of Oslar's specimens is not to be trusted. However, with three other records to date for this general area of northern California Oslar's locality data may be taken at face value for the time being. Whether southern Siskiyou County is to be regarded as the northern limit of *melane* or whether these records represent temporary extensions remains unknown.

Specimens recorded from Prescott, Arizona and "Santa Fe" lack reasonable validity due to their maculation differences from the California populations (Field, personal communication), let alone their extreme isolation, and are not added to the distribution at this time. With further study these latter two specimens may prove to be *P. melane vitellina*, the Mexican subspecies.

There are several records for the central Sierra Nevada foothills which may represent a population extension from San Francisco through Sacramento to the Sierran foothills, there being a continuous belt of moist areas for *melane* to progress across the otherwise dry San Joaquin Valley. It is notable in this context that specimens have been recorded from Antioch (in the Sacramento River delta area west of Sacramento), from Davis, from Sacramento proper, and from Sierran foothill localities near Sacramento and further south to Yosemite. Perhaps a study of adult behavior across this "Sacramento bridge" of moist habitats to the Sierran foothills would elucidate mechanisms of spreading that may have functioned in the San Diego area. Additionally, it may be noted that the foothills are not well collected in comparison to higher elevations in the Sierra Nevada. It is not known if the Sierran localities represent resident populations but recent annual captures in the Yosemite area seem to indicate this.

The southern limit is in the Sierra San Pedro Martir of northern Baja California, as far as is known. There being such few records for this area, further collecting may extend the present limit of *P. melane melane*.



Fig. 4.—1960 to 1970 locality distribution of *P. melane*.



The California populations together with northern Baja California are now considered to comprise the nominate subspecies. The other subspecies are "*P. melane* ssp." (Rindge, 1948) in the Cape San Lucas region of southern Baja California, *P. melane vitellina* (Herrich-Schaeffer) in central Mexico, and *P. melane poa* Evans in Central America. In his catalog of American hesperiids Evans (1955) distinguished the latter subspecies and also designated *zachaeus* Plötz (formerly considered a subspecies of *P. melane*) as synonymous with *Poanes rolla* Mabilie of Surinam. The distribution of all these subspecies is listed below in the interest of including the complete range of the species while detailed data is published for the nominate populations.

### CONCLUSIONS

In theorizing on possible pathways for *P. melane* to enter the San Diego area one might conjecture a desert route from Palm Springs to Mason Valley and then to the foothills of San Diego where the 1941 captures were made. While this route may be possible, it is rather arduous because of the 5,000+ foot barrier imposed by the Laguna Mountains between Mason Valley and the coastal foothills.

Another possibility would involve the decreasing rainfall from Los Angeles (ca. 15 inches per year) to San Diego (ca. 10 inches per year) which may represent a factor in the exclusion of *melane* from San Diego County prior to the opening of suitable "island habitats" due to increased irrigation in the years before 1941. In this context additional life history information, such as the extent of breeding on cultured lawn grasses, would be useful in supporting theories of the spread of *melane* by recognizing the impact these new habitats from man's population growth may have had on its spread into San Diego County. Taking into account more recent records for northern San Diego County, individuals may have flown along the coast from breeding areas near Los Angeles by utilizing these "islands" as steps in reaching the available habitats in San Diego foothills where resident colonies could then breed. Whether identical mechanisms have been used (or are now being used) in the central coastal area of California, where suitable habitats also exist, is not known.

From northern records a third theory is possible. *P. melane* may use the moist habitats near rivers as dispersion routes over a period of seasons or with direct dispersion flights. For ex-

ample, records indicate three river systems as possible routes: 1) the delta area to Mariposa County via the San Joaquin and Merced-Tuolumne Rivers; 2) the delta area to Placer County via the Sacramento and American Rivers; and 3) the delta area to Shasta County via the Sacramento River. It is interesting to note that these routes represent linear moist areas leading up to foothill locality records while such linear moist routes are not present between Los Angeles and San Diego because there the streams are all east to west. Of course, irrigation may have provided a new moist north-south route, as has been mentioned.

The question of whether the spread into San Diego County represents a new extension or merely the reclamation of previously occupied territory also remains unanswered. Perhaps, as Thorne (1963) hypothesized, there is a species rivalry in certain localities involving *melane* and the presence of *melane* and other species may fluctuate year by year, even to the extent of local extinction of one species for decades before the area is recolonized: the appearance of *melane* in San Diego County so abruptly in 1941 may represent such a species rivalry.

Much more information on the adult behavior will be required to define methods of increasing the territory of *melane*. The river route theory of dispersion is a case in point because this method would be more plausible if *melane* had the habit of making long flights. If *melane* individuals are more restricted to their breeding areas then dispersion along river systems—and man-made habitats—would be unlikely answers to problems of increasing territory. With the data available at this time, however, it can be concluded that there was indeed a radical increase in territory about the year 1941 and that the subsequent discovery of *melane* in northern Baja California probably represents a further extension to the south from the San Diego population.

#### ACKNOWLEDGMENTS

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Rindge (AM), Dr. P. M. Arnaud, Jr. (CAS), Dr. H. K. Clench (CM), Dr. J. G. Franclemont (Cornell Univ.), Dr. L. D. Anderson (UCR), and also special thanks to Mr. F. T. Thorne. I wish to thank Dr. J. T. Doyen (UCB) for helping to develop the "Sacramento bridge" idea. Dr. J. A. Powell (UCB) kindly read the manuscript, assisted in technical problems and also secured the locality data from the U.S. National Museum. The examination of several specimens at the USNM by Dr. W. D. Field is appreciated. Dr. C. D. MacNeill also kindly read the manuscript.

### ABBREVIATIONS

AM (American Museum of Natural History); CM (Carnegie Museum); CAS (California Academy of Sciences); CIS (California Insect Survey); LACM (Los Angeles County Museum); UCB (University of California, Berkeley); UCR (University of California, Riverside); USNM (U.S. National Museum). An asterisk indicates that these localities are only considered as part of the distribution on a tentative basis due to their extreme isolation from other populations.

### LOCALITY RECORDS

*Paratrytone melane melane* (Edwards, 1869)

TL: "California"

Calif.: Alameda Co.: Albany, 8 Oct 57 (Powell); Arroyo Hondo, 4 Jul 09 (F.X. Williams); Berkeley, 23 Mar 31, 17 Apr 30, 19 Apr 30 (E.C. Zimmerman), 11 May 65 (E.M. Omi), 18 May 31, 19 May 62 (S. Earnshaw), 7 Sep 57 (Powell), 8 Oct 62 (R.L. Langston); Strawberry Cyn., Berkeley, 16 Apr 50 (Langston), 20 Apr 44, 14 Oct 62 (C.A. Toschi); Irvington, 18 May 02 (Williams); Oakland, 19 Apr 36, 20 Apr 26 (T. Craig), 9 May 08 (Williams), 22 May 55 (B. Hudson); Diamond Cyn., Oakland, 30 Jun 24; Piedmont, 16 Sep 37. Calaveras Co.: Mokelumne Hill, May (F.E. Blaisdell). Colusa Co.: Maxwell, 20 Apr 66 (R.F. Sternitzky). Contra Costa Co.: 2 mi. S. Antioch, 6 Sep 68 (Lane); Briones Hills, 4 May 58 (Opler); Crockett, 30 May 63; Danville, 18 Aug 51 (Williams); Martinez, 1 May 66; 2 mi. S. Moraga, 3 Oct 65 (Langston); Pleasant Hill, 10 May 54, 29 Sep 60 (P.A. Opler); Pt. Molate, Richmond, 22 Sep 66 (Powell); Pt. Richmond, Richmond, 19 May 66 (Langston), 3 Oct 64; San Pablo Resv., 15 May 55 (M.J. McKenney); "Contra Costa Co", 9 May 53. El Dorado Co.: "El Dorado Co" (Koebele collection - CAS) [probably between 1885 and 1887 when Koebele was in California before going to Australia (Essig, 1931)]. Los Angeles Co.: Arroyo Seco, San Gabriel Mts., (2000'), 14 Jun 09 (Grinnell); Long Cyn., San Gabriel Mts., (3000'), 10 Jun 10 (Grinnell); San Gabriel Cyn., San Gabriel Mts., 1 Apr 29 (Gunder); Casa Verdugo, Sep-Oct (H.M. Simms, 1920 - in lit.); Claremont, 14 Apr 26 (T. Craig), 4 May 22; Del Monte, 13 May 44; Palmers Cyn., Claremont, 26 May 21; Dalton Cyn., 20 Apr 28 (J. Gunder); Long Beach, 25 Apr (W. Sweadner



collection - CM); Los Angeles, 19 Mar 01, 2 Apr 1899, 4 Apr 20, 5 Apr 1899, 10 Apr 21 (J.A. Comstock), 11 Apr 1899, 28 Apr 1899, 30 Apr 1899, 2 May 27, 11 May 19, 18 May 18, 19 May 03, 10 Jul 57, 24 Jul 61, 7 Aug 59, 20 Aug 61, 17 Sep 16, 23 Sep 16 (Comstock), 14 Oct 53; Griffith Park, Los Angeles, 11 Apr 23, 31 May 20 (Comstock); Monrovia, 21 Jul 28; Monrovia Cyn., Monrovia, 21 May 49; Mt. Wilson ("nr. Pasadena"), 7 Jun 03 (Grinnell, 1905 - in lit.); Oakcrest, 18 Mar 28, 4 Jun 26, 11 Jun 26; Pasadena, 4 Apr 1900 (Bradford?), 4 Apr 04, 15 Apr 1899, 16 May 04 (Grinnell); Millards Cyn., Pasadena, 21 Mar 26; Pomona, 18 Aug 19 (Lindsey Collection - CM); Temescal Cyn., Santa Monica Mts., 14 Apr 47; Topanga, 22 Feb 61, 17 Apr 59, 30 Apr 60, 5 Aug 55, 25 Aug 55, 30 Aug 55, 7 Sep 56, 9 Sep 56, 14 Sep 57, 19 Sep 60, 8 Oct 58, 8 Oct 62, 9 Oct 57, 23 Oct 57, 27 Oct 57, 29 Oct 55, 27 Nov 58. Marin Co.: Mill Valley, 3 Mar 53 (E.S. Ross); Mt. Tamalpais, 25 May 54 (Powell); Muir Beach, 25 Apr 64; Novato, 19 May 62, 14 Oct 62 (D.C. Rentz); Phoenix Lake, 17 May 62. Mariposa Co.: Briceburg, 5 May 68 (Lane) (Hughes); "Yosemite", 19 Oct 1871 ("S. jr" - T.L. Mead collection - CM); "California", 1871 (James Behrens - ex coll. T.L. Mead - CM: probably the same as from Yosemite). Mendocino Co.: Ukiah, 8 May 19, (Lindsey collection - CM), 17 May 19, 23 May 19, 24 May, 26 May, 8 Aug; "Mendocino Co.", 15-23 May (Barnes collection - USNM). Monterey Co.: Carmel, 9 Sep 41, 28 Sep 42 (L.S. Slevin), 30 Sep 41, 18 Oct 40; between Carmel and Paraiso Springs, 22 Oct 39 (Slevin); Partington Cyn., 9 mi. SE. Big Sur, 14 May 66 (Langston). Napa Co.: 2 mi. W. Calistoga, 30 May 49 (C.D. MacNeill). Orange Co.: Costa Mesa (AM); Placentia, 2 Apr 04 (Bradford). Placer Co.: nr. Applegate, 30 May 61 (MacNeill); Cisco, (ca. 5000'), 1/10 June (AM); Colfax, 10/20 May (AM). Riverside Co.: Indian Wells, 28 Oct 22 (LACM), Mountain Center, 13 Apr 63 (D.E. Bright); Palm Springs, 22 Apr 22 (Coolidge), 1-7 Apr (USNM); Andreas Cyn., Palm Springs, 29 Oct 45 (Timberlake); Riverside, 5 Mar 42, 10 Mar 45 (Timberlake), 24 Mar 40, 14 Sep 28, 15 Oct 33, 1 Nov 28, 18 Nov 28; Santa Ana River (nr?) Chino (S. Bernardino Co.), 16 Apr 26 (T. Craig). Sacramento Co.: Sacramento, 27 May 18 (E.P. Van Duzee), 12 Aug 47 (MacNeill). San Bernardino Co.: Big Santa Ana Cyn. 26 Mar 21 (LACM); Camp Baldy, 25 Apr 32 (T. Craig), 2 May 32; City Cr., 23 Apr 1892 (Wright); Hanson Dam Park, 15 Mar 61; Loma Linda, 16-23 May, 16-23 Apr (USNM); Mill Cr. Cyn., 21 Sep 23 (Van Duzee); Oak Glen Cr., 17 mi. E. Redlands (5000'), 15 Aug 34 (Timberlake); San Bernardino - no date - (W.H. Edwards collection - CM); Small Cyn., 3 Oct 1886 (Wright); San Antonio Cyn., 15 Oct 31 (T. Craig); Summerland, 11 Jul 47; Upland, 29 Mar 27. San Diego Co.: Barrett Dam, 10 Jul 63 (Langston); El Cajon, 12 Mar 61, 2 Apr 61, 12 Apr 60, 15 Apr 61, 7 May 65; 2½ mi. SE. El Cajon (800'), 4 Feb 67, 15 Feb 63, 18 Apr 62 (all F.T. Thorne); 2 mi. S. El Cajon, 26 Jul 41, 2 Aug 41, 2 Aug 42, 3 Aug 41, 8 Aug 41 (all Thorne); Fallbrook, 2 Apr 61 (E.L. Kessel); 2 mi. NE. Lakeside, 29 Mar 61 (Langston); 7 mi. E. Lakeside (550'), 1 Apr 66, 2 Aug 67 (Heppner); La Mesa, 20 Mar 53 (Williams); Mason Valley, 5 Oct 41 (Thorne); Mission Gorge, 4 mi W. Santee (300'), 28 Mar 72, 26 Jul 65 (Heppner), 24 Aug 52 (Powell); Mission Valley at Hwy 395, 5 mi N. San Diego, 9 Aug 66 (Heppner), Mt. Palomar, 18 Jul 63 (Langston); "Mountain area, San Diego County", 28 Mar 36 (LACM); San Diego, 27 Mar 52, 18 May 52 (Powell); Fairmount Cyn., San Diego, 30 Mar 61, 6 Apr 52, 6 May 52 (Powell), 25 Nov 48 (G.A. Marsh); Presidio Park, San Diego, 15 Feb 52, 18 Oct 52 (Powell); 6 mi. N. San Diego (Morena area) (20'), 12 Apr 70 (Heppner); 1 mi. S. Julian, 5 Oct 58; 2 mi. SE



Vista, 8 May 67 (Thorne); "San Diego Co", 15 Mar 59 (J.C. Ball - UCR). San Francisco Co.: Lobos Cr., Presidio Park, 14 Oct 62 (C.A. Toschi); San Francisco, 12 Apr 61, 14 Apr 61 (R.M. Brown), 19 Apr 60 (P.H. Arnaud). San Mateo Co.: Palo Alto, 11 Sep 12, 22 Sep 05 (Newcomer), 10 Oct 33; 15 Oct 06, 18 Oct 06 (Newcomer); Portola [Valley?], 18 May 07 (Newcomer). Santa Barbara Co.: Paradise Camp, 14 Sep 38 (Rindge); Santa Barbara, 1 Feb 35, 9 Feb 33, 26 Feb 35, 4 Mar 35, 12 Mar 35, 13 Mar 34, 20 Apr, 3 May 35, May 36, (Winters - AM), 3 Jul 34, 4 Sep; Sierra Madre Mts., 19 May 18 (LACM). Santa Clara Co.: Alum Rock Park, 20 Mar 61 (J.W. Tilden), 5 Apr 56 (R.F. Fisher), 12 May 53, 18 May 54, 12 Sep 58; Arroyo Mocho, 12 Jun 55 (Powell); Cherry Flat, 24 Sep 39; Las Uvas Cr., Santa Cruz Mts., 26 Jul 13 (J.C. Huguenin); Los Gatos, Apr 33 (J.A. Kusche); 3 mi. W. New Almaden, 20 Apr 66 (Powell). Santa Cruz Co.: Santa Cruz, 4 May (G.M. Dodge), 11 May 38 (Tilden), 4 Jun (Williams), 1 Sep 39 (Tilden), 2 Sep, 7 Sep 27, 14 Sep, 15 Sep (Williams), 19 Sep 27, 23 Sep 09 (Bradbois?). \*Shasta Co.: Burney Mtn., 40 mi. NE. Redding, 5 Jul 30 (E. Guedet). \*Siskiyou Co.: Dunsmuir, Jul 34 (G.H. & J.L. Sperry - AM); "Mt. Shasta", June (Oslar, collector; Lindsey collection - CM). Sonoma Co.: Calabazas Cr., nr. Kenwood, 18 May 68 (Emmel); Sonoma, Aug 36; "Sonoma Co", 29 Sep 1898 (H. Engel collection - CM). Stanislaus Co.: Oakdale, 4 Sep 30, 9 Sep 30 (AM). \*Trinity Co.: Trinity Center, 1 Jun 25 (AM). Tuolumne Co.: Big Oak Flat at Tuolumne River (1000'), 24 Apr 66 (Lane); 3 mi. NE. Tuolumne, 20 May 61 (R.M. Brown). Ventura Co.: N. of Fillmore, 16 Apr 66 (Lane); mouth of Ventura River, 24 Apr 66 (Langston, Powell, and A. J. Slater). Yolo Co.: Davis, 25 Jun 47, 10 Aug 47 (MacNeill). Misc.: Sulphur Mt. Springs, 30 Mar 18 (LACM); Devil's Cyn., 13 May 30 (C.M. Dammers). [Prescott, Ariz., (B.P. Clark, donor - USNM) - may be *P. m. vitellina*. "Santa Fe", Oct 1898 (E.A. Smyth collection - USNM). This may be Santa Fe Springs in Los Angeles County but not Rancho Santa Fe in San Diego County because this name did not arise until 1902 when the Santa Fe Railroad purchased the land in San Diego County. The specimen may also be *P. m. vitellina* from Santa Fe, New Mexico.]

Mexico: 3 mi. S. Encinas, Sierra San Pedro Martir, Baja California Norte, 3 Jun 58 (Powell); 20 mi. E. Descanso, Baja Calif. Norte, 28 Apr 54 (Powell).

### "*Paratrytone melane* — subspecies"

Mexico: La Laguna, Sierra Laguna, Baja California Sur, Oct 1941 (Rindge, 1948).

### *Paratrytone melane vitellina* (Herrich-Schaeffer, 1869)

TL: ?

USA: Texas (MacNeill); Tucson, Ariz. (MacNeill).

Mexico: Los Reyes, D.F., 2 Jul 52 (E.E. Gilbert & C.D. MacNeill - CIS); Durango; Pinal, Puebla; Aguas Caliente, Amecameca; Omilteme, Amula, Xucumantlan, all in Guerrero; Las Vegas; Morelos; Colima; Michoacan; Sinaloa; Chiapas.

El Salvador: (MacNeill).

### *Paratrytone melane poa* Evans, 1955

TL: Mt. Poa, Costa Rica

Guatemala: Volcan de Fuego

Costa Rica: Irazu; Mt. Poa

Panama: Chiriqui

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